Chapter 20

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Chapter 20

The Strange Case of the Wandering Fossil

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ABSTRACT

Since Woodburne (1969) analyzed the three diprotodontid specimens then known from the Mio-Pliocene Beaumaris locality in Victoria, Australia, three more specimens of that group have been recognized. Included among them is a lower jaw, referred here to *Kolopsis* cf. *K. torus*, originally thought to be from Queensland. Strong evidence, however, indicates it is from Beaumaris. Reanalysis of the six diprotodontid specimens now known clearly establishes that two diprotodontids occur at Beaumaris, *Zygomaturus gilli* and *K.* cf. *K. torus*. On the basis of the *K.* cf. *K. torus* jaw supposedly from Queensland, the Beaumaris local fauna is interpreted to be contemporaneous or slightly older than the Alcoota local fauna from the Northern Territory.

INTRODUCTION

In 1909, Mr. Albin Bishop of Austral Hall, Toowoomba, Queensland, Australia, sent a collection of fossils to the Queensland Museum in Brisbane for identification. Mr. C.J. Wild, then acting director of the Queensland Museum, had the collection assessed by F.V. Hoffman. In a letter to Mr. Bishop dated 6 May 1909, Wild passed on Hoffman's determinations and then expressed particular interest in acquiring one of these specimens described as ''Lower jaw (left ramus) of a wallaby, young,'' which was, ''. . . a species new to our collection, to which it is very desirable that it should be added'' (fig. 20.1).

For reasons not at all clear, a year later Mr. Bishop offered the specimens for sale to the National Museum of Victoria (now Museum Victoria) in Melbourne rather than the Queensland Museum (letter to ''To the Curator Melbourne Museum'', 15 June 1910). The entire collection was purchased for £4 on 23 October 1910. The jaw, described as a young wallaby, was registered as NMV P16279 on 9 March 1955. All seven specimens registered as having been purchased from Albin Bishop are said to be from Chinchilla on the Condamine River. However, in his letter of 15 June 1910, Mr. Bishop stated that all the specimens in his collection came from the Darling Downs of Queensland. The Darling Downs is the name given to a fertile agricultural district in southeastern Queensland in which Chinchilla is located. The basis for the more precise location for the fossils as they are registered is not known at this time.

This jaw was first mentioned in the scientific literature by Prof. R.A. Stirton of the University of California, Berkeley, who noted in 1957 that the supposed wallaby was not that at all but a small member of the family Diprotodontidae (Stirton, 1957).

There matters stood until 1977 when it was decided to see if some evidence could be extracted from the specimen itself as to

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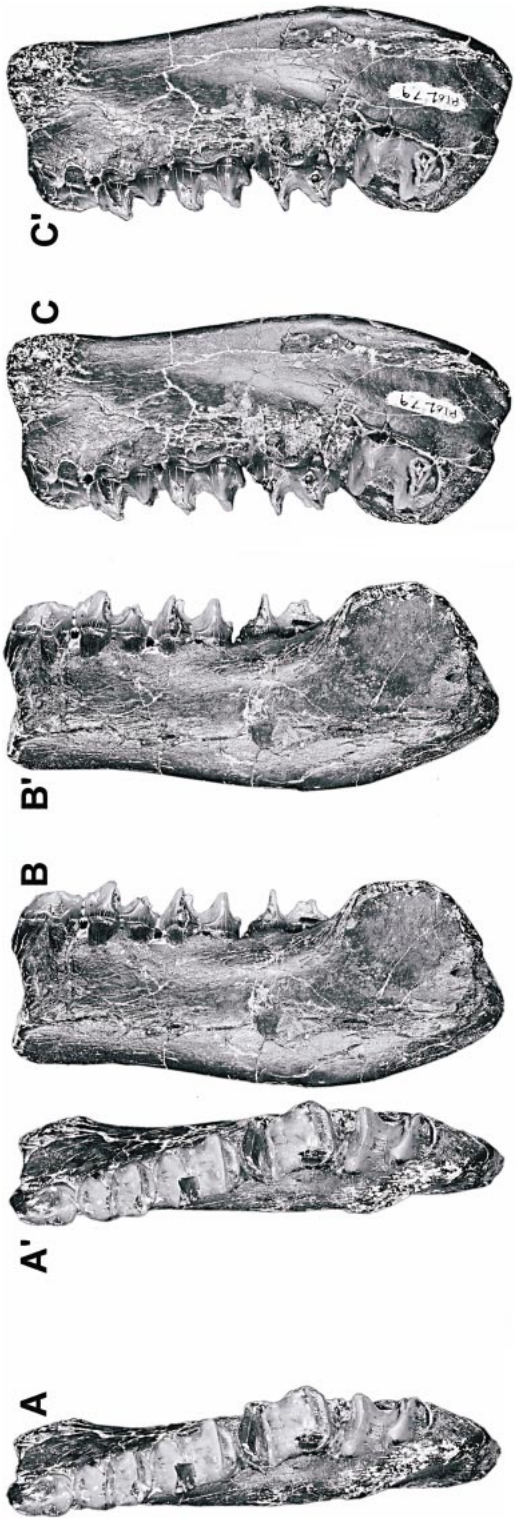

Fig. 20.1. Left mandible of *Kolopsis* cf. *K. torus*, NMV P16279, ×0.5. Presumably from the Mio-Pliocene Beaumaris Local Fauna (see text). A–A′, occlusal view; B–B′, buccal view; C–C′, lingual view.

where it came from. Because the specimen resembled the diprotodontid jaw NMV P15911a–b from Mio-Pliocene deposits at Beaumaris, Victoria, Australia, not only in morphology but also in heft and color, comparisons were made with fossils from there as well as others from the Darling Downs. NMV P16279 was much denser than fossils from the Darling Downs and about the same as the Beaumaris fossils.

Timothy Flannery, then a museum volunteer, examined the specimen under a microscope deliberately looking for signs of encrustations by modern marine organisms, something no one else interested in the problem had thought to do. Because Tim had been hunting fossils at Beaumaris since he was a small boy, he was very familiar with this common feature of fossil bones from there. He quickly noticed a calcareous tube that had been laid down by a spirorbid, a polycheate worm. Dr. J. Kudenov of the Marine Pollution Studies in the Victorian Ministry for Conservation, an expert on polycheates, then determined that the calcareous tube was of a type formed by a spirorbid restricted to marine environments (letter to T. Rich, 28 July 1977). Also attached to the specimen was the foraminiferan, *Rosalina* sp. (Dr. Cliff Mallett, letter to T. Rich, 24 October 1977). The Darling Downs area has not been a marine environment since the Mesozoic Era. Hence, had this fossil been from there, never in its history would it have had an opportunity to become encrusted with this type of marine worm tube or the foraminiferan *Rosalina*.

Although there are other Late Cenozoic rock units in Australia that crop out in the modern ocean, other than Beaumaris, none of those other occurrences is known to have produced a single terrestrial vertebrate fossil. This, coupled with the similarity of the physical and chemical properties cited above and the presence at Beaumaris of a very closely related diprotodontid, strongly supports the hypothesis that this specimen came from Beaumaris rather than Queensland (fig. 20.2).

Terrestrial mammal fossils at Beaumaris are extremely rare; only six specimens of this kind are known, and all are diprodontids. This paucity of material is not owing to a lack of effort. Beaumaris is a suburb of Melbourne, and the coastal outcrops there have been a popular and well-known locality for the last century and a half to both professional paleontologists and amateurs to search for fossils. When Mr. Bishop sold the jaw to Museum Victoria in 1910, only a single terrestrial mammal specimen, an isolated P3, the holotype of *Zygomaturus gilli* Stirton, 1967, was known to have come from Beaumaris (Hall and Pritchard, 1897). Because of the scarcity of this type of fossil from Beaumaris, there has never been a regular traffic among amateurs or scientists in specimens of this nature from this locale. Had the specimen been thought to have come from Beaumaris in 1910, it would have aroused extreme interest, for at that time, this jaw would have been one of the three oldest marsupial fossils known from Australia and the oldest one with any molars preserved. Therefore, no obvious motivation existed to deliberately falsify the site from which the specimen came to enhance interest in it. Quite the contrary, in fact, was the result that the fossil was almost completely ignored scientifically for 90 years. A minor irony is that the specimen came back to Melbourne rather than being sold to the Queensland Museum.

Fig. 20.2. Outline map of Australia showing the locations of Beaumaris and the Darling Downs area.

What sort of man was Albin Bishop (fig. 20.3)? How did he come to possess this specimen? Did he deliberately give erroneous locality data or merely make an innocent error?

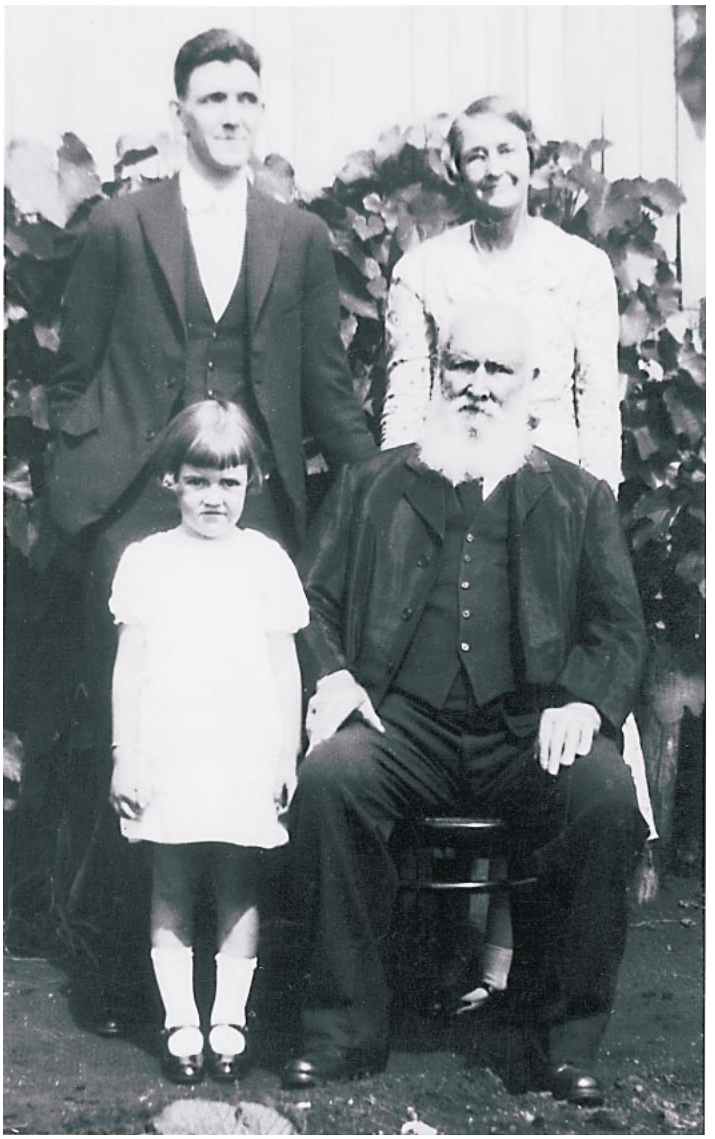

Fig. 20.3. Albin Bishop, seated, with his eldest daughter Emma Maude Montgomery, son-in-law Allen Montgomery, and grandaughter Dawn Montgomery.

If he deliberately falsified this information, what was his motive?

A letter from Albin Bishop to the Queensland Museum gives some impression of the character of the man.

Austral Hall
Toowoomba
May 18th 1909

Mr. C. J. Wild
Acting Director
Queensland Museum
Brisbane

Dear Sir,

I received the parcel of bones also letter of identification of bones. they arrived quite safe. I wish to tender my thanks for your kindness[.] I have a lot of bones that I should be glad to get classed. mostly small bones such as belongs to the feet, jaw bones, and teeth[.] would you do me the favor of classing some more if I send them down.

we have a small Museum here close to Austral Hall in fact it belongs to the Hall[.] we would be very glad with anything that you may have to spare to put in the Museum[.] if you think you could spare anything at all I would mention it to our Committee and put them in communication with you[.]

these bones that I have collected will probably be added to the Museum here[.] it is known as the Science Section that is the reason I am anxious to get them classed[.] that piece of Wallaby (left ramus) a collector badly wanted to buy it from me but he only offered 10/- for it[.]

Could you tell me where I could procure a book on the fossils of Australia[.] I mean of extinct Animals, or a book showing the skeleton of any of them[.] it would be very interesting to me[.]

Thanking you in anticipation

Yours faithfully

A Bishop

In an effort to learn more about Albin Bishop, an article was written for the Toowoomba newspaper, *The Chronicle*, which outlined the history of the specimen as known to that point and asked readers to come forward with any information they might have. As a consequence, Mrs. Kath Gundry of Toowoomba, a grandaughter of Mr. Bishop, contacted T. Rich and provided much additional information about him.

27 Norman Street
Toowoomba 4350
7th Oct. 1977

Dear Mr. Rich,

As a result of the article (enclosed) appearing in the ''Toowoomba Chronicle'' 29/7/77, I am now dropping you a few lines with a little information regarding Mr. Bishop. He was my Grandfather & his name was Albin Bishop & not Albion as was stated.

He was born at Southampton, England, and later came out to Australia. At what age I do not know, but it must have been as a young man, as he came alone and not with his family. His reasons for choosing to settle in Queensland, I again do not know.

*He married Emma Bayley (born at Geelong, Victoria) at Brisbane on 23/10/1878. Their married life was spent at Condamine and there were 3 daughters of the marriage. Sadness came to the family when Mrs. Bishop died in giving birth to their 3rd baby. She was aged 26 and her husband was 30.

Fig. 20.4. Tombstone of Albin Bishop.

In those early days, life was not easy. Grandfather was a bush worker & did fencing, felling trees etc. & any bush work associated with the settler's needs. Lots of times he was camped for long periods in the course of his job (many times alone) & so studied the bush & its creatures. In view of this & the circumstances were such, that he thought it best to have the children properly cared for. He arranged to have the 2 older children adopted into private homes in Brisbane & the baby was fostered by an old lady in Toowoomba. He continued to work out in the Condamine-Miles area until 1900 when he came down to Toowoomba & was able to make a home for himself & his youngest daughter who was 17 year then.

From these facts, I understand that Grandfather's wanderings in the bush took place in the years just before or at the time of his marriage (1878) until the time he came to Toowoomba to live in 1900. So it was within those 22 years or so, that he collected his fossils, which he was so interested in.

In due course his 3 daughters all married. The eldest lived in Brisbane, the 2nd daughter in Toowoomba & the 3rd in Maryborough. (All have passed away now though).

During the time Grandfather lived in Toowoomba, he worked as caretaker at Austral Hall & later as caretaker of the Empire Picture Theatre. He also married again & his 2nd wife was a good deal his junior. Although there was a generation difference in their ages it was a happy marriage. The first few years after they married were spent in running a small corner store & cafe down at Wynnum, a small seaside resort on the outskirts of Brisbane. Then they returned to Toowoomba in 1922 where they resided until the time of Grandfather's death on 10th Nov 1933 [fig. 20.4]. He died at the age

of 80 years—still active in mind & limb. His wife moved down to Wynnum again a few years afterwards, where she lived until the time of her death in Nov 1965. Had your queries ''cropped up'' before then, she would have been able to fill the ''gaps'' in Albin Bishop's life better than I can.

Now for the present—Albin Bishop's 2nd daughter was my mother & she had 2 children, my brother & myself. I knew Grandfather from the time I was 4 until he died when I was 15 years. That would be from 1922 until 1933. He lived a quiet, retired life & kept a very good flower & vegetable garden. It was in the days before people had radios in their homes and so Grandfather was an avid reader & kept up with world affairs. He was a good clean living man—a non-smoker & non-drinker. Only had a glass of wine on very ''special'' occasions, such as birthdays & Xmas. He was highly respected by all who knew him—relations, friends & neighbours. Indeed it would not be his nature to give false information, as he was too interested in science & the world around him. As I write now, I can visualize him sitting in his kitchen reading the old magazine ''The World's News.'' He read it from cover to cover & ''digested & discussed'' the interesting news of the world which it contained. Later he would pass them on to his neighbours & friends to read also. He was a man of ordinary means but very happy with his life.

The newspaper article suggested he may have given false information, but this I am sure would be incorrect, as he was too interested in progress to allow material gain to come to the fore. During this week I had 2 phone calls—one was from a business man my own age and the other from his sister. They lived with their parents just around the corner from Grandfather and his 2nd wife & they shared the same opinion as my brother & I have—Albin Bishop was not the person to give false information or to in anyway withold information either.

Whenever he & his wife went to Brisbane, a visit to the Museum was always a ''must.'' I remember his wife (whom I called Auntie) telling me after Grandfathers death, that she was going to donate a small port-full of his fossils to the Museum. I don't know (I guess she would have taken them there herself), so possibly there could be some record of this donation in the Record Files at the Brisbane Museum. I would say this gift could have been made anytime after Grandfather's death in Nov 1933 to possibly 1940 (approx. when his 2nd wife left Toowoomba to return to Wynnum). I was wondering if there possibly could have been more ''items of interest'' to you people amongst that lot. All his collecting of fossils would have been done in the days he spent in the bush as mentioned earlier.

I hope you find this information of interest & also hope it clarifies your ideas about the type of man Albin Bishop was. I never heard mention of his living in Victoria at anytime of his life, as people couldnt afford the time or money to travel distances in those days.

Hoping I have assisted you,
Your sincerely,
(Mrs) Kath Gundry

P.S. Am enclosing another clipping also, which shows the area up around here has its share of interesting fossils.

P.P.S. The early information given is authentic, as it was taken from the marriage certificate of Albin Bishop & Emma Bayley & also from my Mother's birth certificate—Annie Elizabeth Bishop. If you find out any further information regarding this particular fossil, would you drop me a note & advise. Also, if you feel I can be of any further assistance you could contact me.

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*(First page) on reading over this letter, I thought I could perhaps clarify here. I am almost certain that Albin Bishop met his first wife Emma Bayley out at Condamine, as I can remember Mum saying that her Mother's father wasn't a good father & that she was befriended by a family around the time she wanted to get married. I thought that having stated Emma was born at Geelong, you may start to wonder if a romance had started between them down in Victoria. I have no idea when the Bayleys (father & daughter) came to be at Condamine—I still say that to my knowledge Albin Bishop never was out of the Queensland places already mentioned. I know you will be looking for a ''link'' with the Beaumaris area as you read this life story, but I'm afraid there is nothing as I know it.

On 9 January 1978, the senior author met Mrs. Gundry in her home along with several other people who knew Albin Bishop as either children or young adults. All were of the opinion that Albin Bishop would not have knowingly falsified the locality information.

On this basis, the most reasonable conclusion is that when Albin Bishop contacted first the Queensland Museum and subsequently the National Museum of Victoria about NMV P16279, he was honestly of the opin-

ion that it came from the Darling Downs area.

It will probably never be possible to determine with certainty who transported this fossil from from Beaumaris to Queensland.

If this long distance transport of a rare, non-utilitarian object happened prior to European occupation of Australia, it would not be a unique occurrence. The finding of several meteorites far from their possible source of origin has been attributed to their transport by Aborigines (Bevan and Bindon, 1996). One of the examples cited was the discovery of a fragment of the Henbury Meteorite at Gallipoli Station in the northeastern part of the Northern Territory, a distance from the Henbury Meteor Craters almost as great as that between Beaumaris and the Darling Downs. Furthermore, because the Aborigines have been in Australia for at least 40,000 years, the number of fossils of this nature that would have become exposed by erosion of the fossiliferous unit during that period would have been far greater than the number that have come to light by such processes during the past century and a half. This adds to the likelihood that this specimen was initially found by an Aboriginal.

Had the specimen been found by a European, a person interested enough in the specimen to transport it all the way to Queensland in the 19th century would seemingly more likely have brought it to the attention of staff at the National Museum of Victoria which was located only 21 km from Beaumaris. Clearly from the letters exchanged between C.J. Wild and Albin Bishop mentioned above, the ''Lower jaw (left ramus) of a wallaby, young,'' was a particularly significant specimen and had Bishop been consciously aware of its having come from elsewhere, the character of the man strongly suggests he would have noted the fact. However, inadvertent mix-ups regarding the provenance of fossil vertebrates are certainly not unprecedented. The prosauropod dinosaur *Agrosaurus mcgillivrayi* when named by Seeley (1891), based on a label associated with it, was recorded as having come from the ''N.E coast Australia.'' Subsequently, it was established that this specimen most likely came from the English classic Late Triassic Durdham Down locality near Bristol and almost certainly not from Australia (Rich et al., 1999).

PROVENANCE CONCLUSIONS

So, in conclusion, this rare fossil specimen appears to have had a most remarkable history. First it was transported from Beaumaris 1300 km to the Darling Downs area, either by a European or Europeans and that fact was subsequently forgotten, or by Aboriginals. Following that, it was either found in a region that happened to be rich in somewhat similar late Cenozoic fossils by a person who recognized it as a fossil or it was inadvertently mixed up with a collection of fossils from the Darling Downs. In any case, it was brought to the attention of museum authorities and finally came to be deposited in a museum 21 km from the site of its original discovery.

SYSTEMATIC PALEONTOLOGY AND BIOSTRATIGRAPHY

Since 1910, knowledge of the Australian marsupial fauna from sites as old or even older than that from Beaumaris has grown considerably so the establishment now of the actual provenance is of less consequence than it would have been at the time of purchase. However, NMV P16279 is somewhat better preserved than the other similar jaw from Beaumaris, NMV P15911a–b, and therefore improves our understanding of that particular diprotodontid (fig. 20.5).

This other jaw has an equally bizarre history. The front part was discovered in 1913 in the beach shingle at Beaumaris and the rear part of it not until 54 years later in 1967. When put together, only a few small fragments were missing from the region of contact. Otherwise, the fit was perfect (Woodburne, 1969).

In his analysis of the other jaw, Woodburne (1969) hypothesized that it was an example of the previously unknown lower dentiton of *Zygomaturus gilli*. The most serious objection to that idea is that the lower jaw was significantly smaller than what would be expected on the basis of the size of the upper dentition. In 1969, there was only one lower and one upper molar series referred to *Z. gilli* plus the P3 that was the holotype of *Z. gilli*.

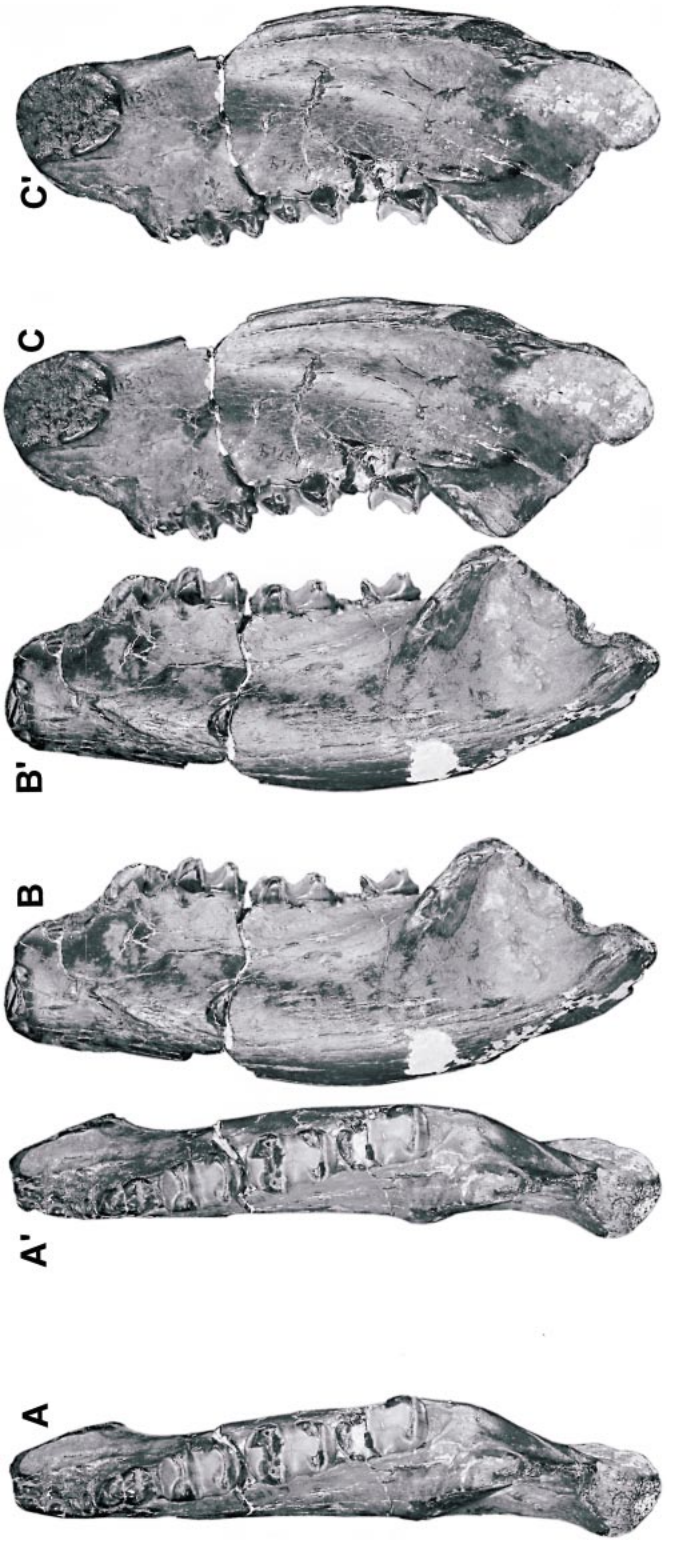

Fig. 20.5. Right mandible of *Kolopsis* cf. *K. torus*, NMV P15911a–b, late Miocene Beaumaris Local Fauna, ×0.5. A–A′, occlusal view; B–B′, buccal view; C–C′, lingual view. Mirror image to facilitate comparison with NMV P16279 (fig. 20.1).

TABLE 20.1
Measurements of p3–m4 (in mm)

	Beaumaris			Range and sample size for *Kolopsis torus* from Alcoota[b]
	Kolopsis cf. *K. torus*		*Zygomaturus gilli*	
	NMV P 16279	NMV P 15911a–b	NMV P 150125 (cast[a])	
p3 length	16.3			12.3–15.5, 22
p3 width	10.3			9.1–11.3, 22
m1 length	19.0	>17.8		17.2–19.0, 12
m1 trigonid width	⩾12.4			12.1–14.8, 10
m1 talonid width	12.9			12.5–15.5, 11
m2 length	21.0	19.1		18.7–21.6, 19
m2 trigonid width	14.0	>11.6		14.1–17.3, 14
m2 talonid width	14.3	>12.7		13.8–16.0, 17
m3 length	23.3	21.9		21.8–25.8, 14
m3 trigonid width	⩾16.1	>15.1		16.4–19.7, 13
m3 talonid width	⩾15.2	>13.7		15.5–18.1, 13
m4 length	⩾22.5	22.6	30.4	22.1–27.0, 19
m4 trigonid width	17.0		22.8	17.3–21.0, 19
m4 talonid width	>15.1	>14.1	20.7	15.6–20.0, 15

[a]The original specimen was found by Mr. Brian Crichton prior to 1977 and has been retained by him. The cast is illustrated in figure 6 of Rich (1976).

[b]Range data for *Kolopsis torus* from Woodburne (1967).

Woodburne proposed that the specimens available represented the smallest and largest sized individuals in the population.

Since then, besides the addition of Albin Bishop's specimen, two other diprotodontid specimens from Beaumaris have come to light, an isolated m4 and a maxilla with M2–4. The measurements of all the Beaumaris diprotodontids have been listed along with the size range and number of specimens for each measurement in a large sample of *Kolopsis torus* Woodburne 1967 from the Alcoota Local Fauna in the Northern Territory (tables 20.1, 20.2). Inspection of those tables reveals that the two lower jaws are equivalent in size to the smaller members of the Alcoota sample. In sharp contrast, all the individual measurements of the isolated m4 and upper dentitions are well above the size range of the Alcoota *K. torus* material, where there is an average of between 15 and 16 measurements of each dental dimension tabulated. In a sample of six, to get only the largest and smallest individuals in a population with none near the mean is highly unlikely. Therefore, it is now quite probable that two diprotodontids are represented at Beaumaris rather than one.

Stirton (1967) observed that the distinction between *Kolopsis* and *Zygomaturus* was quite subtle, primarily a matter of size. The two lower jaws from Beaumaris, NMV P16279 and NMV P15911a–b, fall into the size range of the Alcoota *Kolopsis torus* sample (tables 9, 11, 12, Woodburne, 1967). There is little morphological evidence to separate these Beaumaris and Alcoota specimens, except that the size of the p3 of NMV P16279 is somewhat larger both in absolute length and in comparison to the length of the m1 than in any of the Alcoota specimens. Woodburne (1969) noted the following differences between the dentition of NMV P15911a–b and the Alcoota sample of *K. torus*: "... better developed metalophid and the asymmetrically V-shaped rather than symmetrically U-shaped transverse valley of the molars, the relatively narrow molar proportions, and the more anterior position of the genial pits. . . ." These features can also be assessed on NMV P16279. If anything, the metalophid is even stronger and thus more unlike *K. torus*. However, the transverse valley is U-shaped and symmetrical, the difference possibly due to NMV P16279 being a juvenile with only moderately worn teeth, unlike NMV P15911a–b. The relatively narrower molar proportions are repeated

TABLE 20.2
Measurements of P3 and M2–4 (in mm)

	Beaumaris			
	Zygomaturus gilli			
	MUGD 2020 = NMV P 209962 (holotype)	NMV P 15909[a]	NMV P 194569 (cast[b])	Range and sample size for *Kolopsis torus* from Alcoota[c]
P3 length	23.2			17.1[d]–20.5, 18
P3 width	17.4			13.7–16.1, 17
M2 length			27.4	19.7–22.9, 11
M2 anterior width			24.3[e]	19.2–21.4, 7
M2 posterior width		20.9	23.7	17.8–21.4, 9
M3 length		28.0	30.6	21.5–25.0, 18
M3 anterior width		25.4	28.2	20.4–23.2, 17
M3 posterior width		21.6	24.7	17.7–21.1, 18
M4 length		28.0	31.0	21.2–25.3, 18
M4 anterior width		23.8	27.8	20.1–23.3, 17
M4 posterior width		18.5	22.1	14.8–22.0, 18

[a]Measurements from Stirton (1957).

[b]Measurements made on actual specimen on 25 June 1990. Specimen then returned to its owner, Mr. Dwayne Gates of Brighton, Victoria, Australia. The original specimen is illustrated in figure 254 of Vickers-Rich and Rich (1999).

[c]Range data for *Kolopsis torus* from Woodburne (1967).

[d]Listed as an approximate measurement in Woodburne (1967), the smallest P3 length of the *Kolopsis torus* material from Alcoota otherwise is 17.6 mm.

[e]Enamel on buccal side missing. Measurement made against dentine. Enamel thickness about 1.0 mm immediately adjacent to spot where width measurement taken.

on NMV P16279. Although the genial pit is not developed on NMV P16279, the posteroventral corner is in the same region of the jaw on NMV P15911a–b, that is, below the m1. This is in the same position as on the jaw of *K. torus*; see figure 6b in Woodburne (1967). NMV P16279 thus shares with NMV P15911a–b two of the differences noted by Woodburne (1967) between *Z. gilli* and *K. torus*, while being like *K. torus* in two others, one of which (the position of the region of the genial pit) appears to be shared by NMV P15911a–b. In addition to these four differences, Woodburne (1969) noted two others that could not be assessed on NMV P16279, namely the nature of the cross section of the base of the i1 and the degree of development of the postalveolar process. Finally, unlike NMV P15911a–b, NMV P16279 differs from *K. torus* in lacking a genial pit. The five differences between both Beaumaris lower jaws and the Alcoota *K. torus* are not striking. However, the greater size of the p3 relative to the m1 may indicate that the Beaumaris mandibles represent a somewhat more primitive zygomaturine than the Alcoota *K. torus*, as the more derived species of *Zygomaturus* have an even more reduced p3 relative to the m1.

The two Beaumaris diprotodontoid mandibles now appear to be distinct from *Zygomaturus gilli*, and although not identical to *Kolopsis torus*, they are certainly not markedly different from it. It, therefore, seems reasonable to assign these two jaws, NMV P15911a–b and NMV P16279, to the taxon *Kolopsis* cf. *K. torus*.

The two Beaumaris lower diprotodontid jaws assigned to *Kolopsis* cf. *K. torus* are more readily separated from *Kolopsis rotundus* Plane 1967 and *Kolopsis yperus* Murray, Megirian & Wells 1993 than from *Kolopsis torus*. They differ from *K. rotundus* in several features enumerated by Woodburne (1969). In addition, in contrast to the case with *K. torus*, the p3 of the Beaumaris diprotodontid is relatively smaller as compared to the m1. Because only a single scrap of a lower jaw of *K. yperus* is known, there is little that can be compared. However, the tax-

on *K.* cf. *K. torus* differs in being noticeably less robust than *K. yperus* (Murray et al., 1993).

The other markedly larger Beaumaris diprotodontid material is referred to *Zygomaturus gilli*.

Although the fossil remains of terrestrial mammals are rare at Beaumaris, they have a biostratigraphic utility that their mere numbers belie. This is because they provide one of the rare tie points for the mammalian biochronology of the Australian Neogene to the outside world and across the continent. Singleton (1941) established the Cheltenhamian Stage on the basis of the fossils that occur in the Black Rock Sandstone of the Brighton Group at Beaumaris. These were the source rock for the terrestrial Neogene diprotodontoids found there. Based on its content of marine macroinvertebrates, the Cheltenhamian is regarded as late Miocene (Beu, 1973).

SYSTEMATIC AND BIOSTRATIGRAPHIC CONCLUSIONS

The inland Australian Neogene terrestrial mammal localities are very poorly controlled biostratigraphically, and, to date, other methods of geochronology have been found to be of limited application at sites that produce such fossils (Stirton et al., 1968; Woodburne et al., 1985; Rich et al., 1991). Thus, the presence at Beaumaris of a diprotodontid closely allied, if not conspecific, to *Kolopsis torus* at Alcoota is of significance in providing evidence that the Alcoota Local Fauna is of Cheltenhamian age or possibly slightly younger. The basis for tentatively regarding the Alcoota Local fauna as slightly younger being the larger size of the Beaumaris *K.* cf. *K. torus* p3.

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